Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	12065102	@ad<"20011214"	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	OFF	2005/04/17 15:42
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L3	11	1 and 2	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	OFF	2005/04/17 15:47
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L6	3452	1 and 5	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	OFF	2005/04/17 15:49
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L8	162	6 and 7	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	OFF	2005/04/17 15:49
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L11	1989664	storage or disk or disc	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	OFF	2005/04/17 15:49
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L14	380	map same snapshot	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	OFF	2005/04/17 15:50
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L16	598	map$3 same snapshot	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	OFF	2005/04/17 15:50
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L18	40677	bit same map$3	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	OFF	2005/04/17 15:53
L19	10	17 and 18	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	OFF	2005/04/17 16:03
L20	3	US-5241670-$.DID. OR US-6061770-$.DID. OR US-6131148-$.DID.	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	OFF	2005/04/17 16:03
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L25	562	secondary with virtual with storage	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	OFF	2005/04/17 16:05
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L41	4315	34 or 35 or 36 or 37 or 38 or 39 or 40	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	OFF	2005/04/17 16:27

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L44	2	reallocat$3 near4 virtual near4 map$3	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	OFF	2005/04/17 16:28
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1 Computer aids systems map-based record systems
A. V. Bennettson
June 1978   **Proceedings of the 15th conference on Design automation**

Full text available: 📄 pdf(988.15 KB)   Additional Information: full citation, abstract, references, citings, index terms

From discussion of user encountered production bottlenecks it is demonstrated that personnel sub-system requirements will drive developments in hardware, software, systems configuration and data base structure over the near-term future. Examples are taken from the discussion and used to illustrate exploitation of known capabilities.

2 A parallel bit map processor architecture for DA algorithms
Tom Blank, Mark Stefik, Willem vanCleemput
June 1981   **Proceedings of the 18th conference on Design automation**

Full text available: 📄 pdf(748.21 KB)   Additional Information: full citation, abstract, references, citings, index terms

Bit maps have been used in many Design Automation (DA) algorithms such as printed circuit board (PCB) layout and integrated circuit (IC) design rule checking (DRC). The attraction of bit maps is that they provide a direct representation of two-dimensional images. The difficulty with large scale use of bit maps (e.g., for DRC on VLSI) is that the large amounts of data can consume impractical amounts of computation on sequential machines. This paper describes a processing architect ...

3 Interactive posters: FIASCO: game interface for location-based play
Michele Chang, Elizabeth Goodman
August 2004   **Proceedings of the 2004 conference on Designing interactive systems: processes, practices, methods, and techniques**

Full text available: 📄 pdf(229.17 KB)   Additional Information: full citation, abstract, references, index terms

In this paper we describe FIASCO, a location based street game that is played both on a website and on the city streets. In the current technology landscape, data is readily accessed via an array of devices and across a variety of locations. There are many resulting design opportunities, but location based computing poses challenges. With FIASCO, the authors propose game design as a research tool to explore new approaches to computing in public space. Engaging with place, promoting self expressi ...

Keywords: design research, game design, iterative design, reflective design, user interface design

4 Human Pacman: a mobile, wide-area entertainment system based on physical, social, and ubiquitous computing
Adrian David Cheok, Kok Hwee Goh, Wei Liu, Farzam Farbiz, Siew Wan Fong, Sze Lee Teo, Yu Li, Xubo Yang
May 2004   **Personal and Ubiquitous Computing**, Volume 8 Issue 2

Full text available: 📄 pdf(2.10 MB)   Additional Information: full citation, abstract, index terms

Human Pacman is a novel interactive entertainment system that ventures to embed the natural physical world seamlessly with a fantasy virtual playground by capitalizing on mobile computing, wireless LAN, ubiquitous computing, and motion-tracking technologies. Our human Pacman research is a physical role-playing augmented-reality computer fantasy together with real human–social and mobile gaming. It emphasizes collaboration and competition between players in a wide outdoor physical area whic ...

Keywords: Collaboration, Physical interaction, Social computing, Tangible interaction, Ubiquitous computing, Wearable computer

5 Custom Data Layout for Memory Parallelism

Byoungro So, Mary W. Hall, Heidi E. Ziegler

March 2004 **Proceedings of the international symposium on Code generation and optimization: feedback-directed and runtime optimization**

Full text available: pdf(246.29 KB)   Additional Information: full citation, abstract

In this paper, we describe a generalized approach toderiving a custom data layout in multiple memory banksfor array-based computations, to facilitate high-bandwidthparallel memory accesses in modern architectures wheremultiple memory banks can simultaneously feed one ormore functional units. We do not use a fixed data layout,but rather select application-specific layouts according toaccess patterns in the code. A unique feature of this approachis its flexibility in the presence of code reorderin ...

6 Paper session #1: Experimental evaluation of vision and speech based multimodal interfaces

Emilio Schapira, Rajeev Sharma

November 2001 **Proceedings of the 2001 workshop on Perceptive user interfaces**

Full text available: pdf(581.28 KB)   Additional Information: full citation, abstract, references

Progress in computer vision and speech recognition technologies has recently enabled multimodal interfaces that use speech and gestures. These technologies o er promising alternatives to existing interfaces because they emulate the natural way in which humans communicate. However, no systematic work has been reported that formally evaluates the new speech/gesture interfaces. This paper is concerned with formal experimental evaluation of new human-computer interactions enabled by speech and hand ...

7 A structured specification of a hierarchical operating system

Ashok R. Saxena, Thomas H. Bredt

April 1975 **ACM SIGPLAN Notices , Proceedings of the international conference on Reliable software**, Volume 10 Issue 6

Full text available: pdf(730.69 KB)   Additional Information: full citation, abstract, references, citings, index terms

This paper applies the concepts of hierarchical levels of abstraction and structured programming to the design of a large program system. An operating system for a multi-processor installation is specified that supports a large number of concurrently active processes and provides a virtual store for them. The specification is in an extended version of PASCAL, a high-level language.

Keywords: Hierarchies, Levels of abstraction, Operating systems, PASCAL, Structured programming

8 Building Distributed Context-Aware Applications

Tore Urnes, Arne S. Hatlen, Pål S. Malm, Øystein Myhre

January 2001 **Personal and Ubiquitous Computing**, Volume 5 Issue 1

Full text available: pdf(72.39 KB)   Additional Information: full citation, abstract, index terms

Context-aware applications gather information from sensors about their users and operating environment. Sensor handling is a complicated issue that makes it hard and time-consuming to develop context-aware applications. This paper shows how dynamic discovery protocols can be employed to deal with the physical distribution of sensors and the need to share sensors between many applications. We report on our experiences from building a position-aware application using the dynamic discovery protocol ...

9 Automatic modeling of a 3D city map from real-world video

Hiroshi Kawasaki, Tomoyuki Yatabe, Katsushi Ikeuchi, Masao Sakauchi

October 1999 **Proceedings of the seventh ACM international conference on Multimedia (Part 1)**

Full text available: pdf(1.67 MB)   Additional Information: full citation, abstract, references, citings, index terms

Mixed reality (MR) systems which integrate the virtual world and the real world have become a major topic in the research area of multimedia. As a practical application of these MR systems, we propose an efficient method for making a 3D map from real-world video data. The proposed method is an automatic organization method focusing on video objects to describe video data in an efficient way, i.e., by collating the real-world video data with map information using DP matching. To demonstrate ...

10 Virtual and augmented reality: FingARtips: gesture based direct manipulation in Augmented Reality

Volkert Buchmann, Stephen Violich, Mark Billinghurst, Andy Cockburn

June 2004 **Proceedings of the 2nd international conference on Computer graphics and interactive techniques in Australasia and Southe East Asia**

Full text available: pdf(590.58 KB)   Additional Information: full citation, abstract, references, index terms

This paper presents a technique for natural, fingertip-based interaction with virtual objects in Augmented Reality (AR) environments. We use image processing software and finger- and hand-

based fiducial markers to track gestures from the user, stencil buffering to enable the user to see their fingers at all times, and fingertip-based haptic feedback devices to enable the user to feel virtual objects. Unlike previous AR interfaces, this approach allows users to interact with virtual content using ...

Keywords: Augmented Reality, gesture interaction, occlusion

11 <u>Solemn: Solaris Emulation Mode for Sparc Sulima</u>

Bill Clarke
April 2004 **Proceedings of the 37th annual symposium on Simulation**

Full text available: <u>pdf(160.28 KB)</u>   Additional Information: <u>full citation, abstract</u>

In this paper we present Solemn, a new user-level simulationmode for Sparc Sulima, a SPARC V9 complete machinesimulator. Solemn extends Sparc Sulima allowing it tosimulate at user-level an unmodified Solaris executable: 32or 64-bit, and statically or dynamically linked. This yieldssome advantages over both complete machine simulatorsand traditional system call emulation. To do this, Solemnmanages the virtual address space and files that the simulatedprogram requires, and intercepts and emulates ...

12 <u>Invited workshop on adaptive systems for ubiquitous computing: Usability of mobile devices and intelligently adapting to a user's needs</u>

Stephen Greene, Jason Finnegan
September 2003 **Proceedings of the 1st international symposium on Information and communication technologies**

Full text available: <u>pdf(155.86 KB)</u>   Additional Information: <u>full citation, abstract, references</u>

Usability is defined in ISO 9241 (1998) as the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction. Usability in relation to mobile services i.e. services that run on Mobile Phones and PDAs must look at the mobile user and surmise what interfaces for mobile services are appreciated and anticipated by the user. This paper will cover the area of usability issues when developing Mobile services. It will look at the mobi ...

13 <u>G2ST: a novel method to transform GML to SVG</u>

Zhimao Guo, Shuigeng Zhou, Zhengchuan Xu, Aoying Zhou
November 2003 **Proceedings of the 11th ACM international symposium on Advances in geographic information systems**

Full text available: <u>pdf(204.46 KB)</u>   Additional Information: <u>full citation, abstract, references, index terms</u>

Geography Markup Language (GML) has been adopted as *de facto* standard for geo-referenced information storing and exchanging, while Scalable Vector Graphics (SVG), also a W3C-recommended XML standard, is appearing as an ideal format for rendering maps. Usually, Extensible Stylesheet Language Transformations (XSLT) is used to transform GML documents toSVG documents. Considering the complexity and variety of GML documents, however, designing XSLT rules is not a easy task; even worse, such a ...

Keywords: GML, SVG, transforming language

14 <u>HYPERPRESENCE - AN APPLICATION ENVIRONMENT FOR CONTROL OF MULTI-USER AGENTS IN MIXED REALITY SPACES</u>

Douglas Tavares, Aquiles Burlamaqui, Anfranserai Dias, Meika Monteiro, Viviane Antunes, George Thó, Tatiana Tavares, Carlos Lima, Luiz Gonçalves, Guido Lemos, Pablo Alsina, Adelardo Medeiros
March 2003 **Proceedings of the 36th annual symposium on Simulation**

Full text available: <u>pdf(187.88 KB)</u>   Additional Information: <u>full citation, abstract, index terms</u>

The HYPERPRESENCE system proposed in this work is amix between hardware and software platforms developedfor control of multi-user agents in a mixed realityenvironment. The hardware basically composed by robotsystems that manipulate objects and move in a closed, realenvironment and a video camera, imaging system. Theenvironment can be any place that provides or needsinteraction with virtual environments for showing resultsor else to allow manipulation on it via a virtual realityinterface. The sof ...

15 <u>Session 8: miscellaneous topics: Pattern based procedural textures</u>

Sylvain Lefebvre, Fabrice Neyret
April 2003 **Proceedings of the 2003 symposium on Interactive 3D graphics**

Full text available: <u>pdf(21.44 MB)</u>   Additional Information: <u>full citation, abstract, references</u>

Numerous real-time applications such computer games or flight simulators require non-repetitive high-resolution texturing on large landscapes. We propose an algorithm which procedurally determines the texture value at any surface location by aperiodically combining provided patterns according to user-defined controls such as a probability distribution (possibly non stationary). Our algorithm can be implemented on programmable hardware by taking advantage of the texture

indirection ability of rec ...

Keywords: graphics hardware, landscape, proceduralism, textures

16 Modeling/simulation: Modeling virtual object behavior within virtual environment
Gun A. Lee, Gerard Jounghyun Kim, Chan-Mo Park
November 2002 **Proceedings of the ACM symposium on Virtual reality software and technology**
Full text available: pdf(1.15 MB)   Additional Information: full citation, abstract, references, citings, index terms

Development of virtual reality systems requires iterations of specification, implementation and evaluation. Since correct evaluations of immersive VR systems require the tedious process of wearing many devices, there exist both temporal and spatial gaps between the implementation and evaluation stage, and this usually causes delay and inefficiency in the development process. In order to overcome this gap, there have been several approaches to constructing or modeling the physical aspects of the ...

Keywords: 3D interaction, interactive behavior modeling, programming by demonstration, virtual environment, virtual object

17 Data collections and MM: DVR-Pompei: a 3D information system for the house of the Vettii in openGL environment
Maurizio Forte, Eva Pietroni, Claudio Rufa, Angela Bizzarro, Alessandro Tilia, Stefano Tilia
November 2001 **Proceedings of the 2001 conference on Virtual reality, archeology, and cultural heritage**
Full text available: pdf(11.24 MB)   Additional Information: full citation, abstract, references, index terms

DVR *(Desktop Virtual Reality)* Pompei project is aimed to the creation of a virtual reality desktop system able to connect and to visualize data and spatial models in the same environment, interface and three-dimensional context of interaction. The archaeological case study of the House of Vettii has been chosen because of the features of the monument, of the related data, of the urgent needs of restoration, preservation and documentation and of the activity "in situ" of the Istituto Centr ...

Keywords: 3D information systems, archaeometry, desktop virtual reality, house of the vettii, pompei, restoration, spatial data

18 Session 2D: group and organizational dynamics: A robust cooperation architecture for teams of UCAVs
François Legras
July 2002   **Proceedings of the first international joint conference on Autonomous agents and multiagent systems: part 1**
Full text available: pdf(115.86 KB)   Additional Information: full citation, abstract, references, index terms

In this paper, we deal with cooperation in communication-limited and dynamic environments. More precisely, the focus is on cooperation with local communication for teams of non-selfish agents operating in dynamic and unpredictable environments. We propose a framework that allow the creation and evolution of groups (sub-teams) within a team. We support this framework by experimental and formal results.

19 Object-oriented modeling: a roadmap
Gregor Engels, Luuk Groenewegen
May 2000   **Proceedings of the Conference on The Future of Software Engineering**
Full text available: pdf(1.43 MB)   Additional Information: full citation, references, citings, index terms

Keywords: UML, development process, frameworks, object-oriented modeling, patterns, profile, views

20 Testbed evaluation of virtual environment interaction techniques
Doug A. Bowman, Donald B. Johnson, Larry F. Hodges
December 1999 **Proceedings of the ACM symposium on Virtual reality software and technology**
Full text available: pdf(1.55 MB)   Additional Information: full citation, abstract, references, citings, index terms

As immersive virtual environment (VE) applications become more complex, it is clear that we need a firm understanding of the principles of VE interaction. In particular, designers need guidance in choosing three-dimensional interaction techniques. In this paper, we present a systematic approach, testbed evaluation, for the assessment of interaction techniques for VEs. Testbed evaluation uses formal frameworks and formal experiments with multiple independent and dependent variables in order ...

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1 Automatic modeling of a 3D city map from real-world video
Hiroshi Kawasaki, Tomoyuki Yatabe, Katsushi Ikeuchi, Masao Sakauchi
October 1999 **Proceedings of the seventh ACM international conference on Multimedia (Part 1)**

Full text available: 📄 pdf(1.67 MB)   Additional Information: full citation, abstract, references, citings, index terms

> Mixed reality (MR) systems which integrate the virtual world and the real world have become a major topic in the research area of multimedia. As a practical application of these MR systems, we propose an efficient method for making a 3D map from real-world video data. The proposed method is an automatic organization method focusing on video objects to describe video data in an efficient way, i.e., by collating the real-world video data with map information using DP matching. To demonstrate ...

2 Session 2D: group and organizational dynamics: A robust cooperation architecture for teams of UCAVs
François Legras
July 2002   **Proceedings of the first international joint conference on Autonomous agents and multiagent systems: part 1**

Full text available: 📄 pdf(115.86 KB)   Additional Information: full citation, abstract, references, index terms

> In this paper, we deal with cooperation in communication-limited and dynamic environments. More precisely, the focus is on cooperation with local communication for teams of non-selfish agents operating in dynamic and unpredictable environments. We propose a framework that allow the creation and evolution of groups (sub-teams) within a team. We support this framework by experimental and formal results.

3 Session 1: Space-optimal multi-writer snapshot objects are slow
Panagiota Fatourou, Faith Fich, Eric Ruppert
July 2002   **Proceedings of the twenty-first annual symposium on Principles of distributed computing**

Full text available: 📄 pdf(921.09 KB)   Additional Information: full citation, abstract, references, citings

> We consider the problem of wait-free implementation of a multi-writer snapshot object with $m \geq 2$ components shared by $n > m$ processes. It is known that this can be done using m multi-writer registers. We give a matching lower bound, slightly improving the previous space lower bound. The main focus of the paper, however, is on time complexity. The best known upper bound on the number of steps a process has to take to perform one operation of the snapshot is $O(...$

4 Long-lived and adaptive atomic snapshot and immediate snapshot (extended abstract)
Yehuda Afek, Gideon Stupp, Dan Touitou
July 2000   **Proceedings of the nineteenth annual ACM symposium on Principles of distributed computing**

Full text available: 📄 pdf(1.07 MB)   Additional Information: full citation, abstract, references, citings, index terms

> Long-lived and adaptive to point contention implementations of snapshot and immediate snapshot objects in the read/write shared-memory model are presented. In [2] we presented adaptive algorithms for mutual exclusion, collect and snapshot. However, the collect and snapshot algorithms were adaptive only when the number of local primitive operations that a process performs are ignored, i.e., not counted. The number of primitive local steps (operations that do not access the shared memory) in ...

5 A snapshot differential refresh algorithm
Bruce Lindsay, Laura Haas, C. Mohan, Hamid Pirahesh, Paul Wilms
June 1986   **ACM SIGMOD Record , Proceedings of the 1986 ACM SIGMOD international conference on Management of data**, Volume 15 Issue 2

This article presents an algorithm to refresh the contents of database snapshots. A database snapshot is a read-only table whose contents are extracted from other tables in the database. The snapshot contents can be periodically refreshed to reflect the current state of the database. Snapshots are useful in many applications as a cost effective substitute for replicated data in a distributed database system. When the snapshot contents are a simpl ...

6 Immediate atomic snapshots and fast renaming

Elizabeth Borowsky, Eli Gafni

September 1993 **Proceedings of the twelfth annual ACM symposium on Principles of distributed computing**

7 Atomic snapshots in O(n log n) operations

Hagit Attiya, Ophir Rachman

September 1993 **Proceedings of the twelfth annual ACM symposium on Principles of distributed computing**

8 Atomic snapshots of shared memory

Yehuda Afek, Hagit Attiya, Danny Dolev, Eli Gafni, Michael Merritt, Nir Shavit

September 1993 **Journal of the ACM (JACM)**, Volume 40 Issue 4

This paper introduces a general formulation of atomic snapshot memory, a shared memory partitioned into words written (updated) by individual processes, or instantaneously read (scanned) in its entirety. This paper presents three wait-free implementations of atomic snapshot memory. The first implementation in this paper uses unbounded (integer) fields in these registers, and is particu ...

Keywords: atomic, consistent state, fault-tolerance, snapshot

9 Inferring constraints from multiple snapshots

David Kurlander, Steven Feiner

October 1993 **ACM Transactions on Graphics (TOG)**, Volume 12 Issue 4

Many graphic tasks, such as the manipulation of graphical objects and the construction of user-interface widgets, can be facilitated by geometric constraints. However, the difficulty of specifying constraints by traditional methods forms a barrier to their widespread use. In order to make constraints easier to declare, we have developed a method of specifying constraints implicitly, through multiple examples. Snapshots are taken of an initial scene configuration, and one or more additional ...

Keywords: constraints, empirical learning, graphical editing

10 Atomic snapshots of shared memory

Yehuda Afek, Danny Dolev, Hagit Attiya, Eli Gafni, Michael Merritt, Nir Shavit

August 1990 **Proceedings of the ninth annual ACM symposium on Principles of distributed computing**

11 Tool support for validating UML and OCL models through automatic snapshot generation

Martin Gogolla, Mark Richters, Jörn Bohling

September 2003 **Proceedings of the 2003 annual research conference of the South African institute of computer scientists and information technologists on Enablement through technology**

This paper studies tool support for the testing and certification of UML and OCL models as supported by the validation tool USE. We describe the features available in the UML/OCL tool USE and extend its features by introducing a language for defining properties of desired snapshots and by showing how such snapshots are generated. We explain the functionality offered by the USE tool. In particular, we demonstrate how the diverse windows, e.g., object diagram, class invariant, class extent, or OCL ...

Keywords: OCL constraint, UML model, certification, design, languages, snapshot, validation, verification

12 Session 5B: A tight time lower bound for space-optimal implementations of multi-writer snapshots

Panagiota Fatourou, Faith Fich, Eric Ruppert

Full text available: pdf(232.46 KB)   Additional Information: full citation, abstract, references, citings, index terms

A snapshot object consists of a collection of $m > 1$ components, each capable of storing a value, shared by n processes in an asynchronous shared-memory distributed system. It supports two operations: a process can UPDATE any individual component or atomically SCAN the entire collection to obtain the values of all the components. It is possible to implement a snapshot object using m registers so that each operation takes $O(mn)$ time.In a previous paper, we proved tha ...

Keywords: lower bounds, shared-memory distributed computing, snapshot, space-optimal

13 Shared momory objects: Efficient synchronous snapshots

Alex Brodsky, Faith Ellen Fich

Full text available: pdf(186.05 KB)   Additional Information: full citation, abstract, references, index terms

A snapshot is an important object in distributed computing whose implementation in asynchronous systems has been studied extensively. It consists of a collection of $m > 1$ components, each storing a value, and supports two atomic operations: an UPDATE of a specified component's value and a SCAN of all components to determine their values at some point in time.In this paper, we investigate implementations of a multiwriter snapshot object in a synchronous shared memory model. In this setti ...

Keywords: multiprocessor algorithms, shared memory objects

14 Software development snapshots: A preliminary investigation

Laura Marie Leventhal

Full text available: pdf(341.44 KB)   Additional Information: full citation, abstract, references, index terms

A continuing challenge to investigators of human-computer interaction issues is the selection of an appropriate methodology. A particularly difficult aspect of methodology has been the choice of a proper test instrument. In the past, small programs have been favored by researchers because they were relatively easy to manage in a controlled experimental setting. Unfortunately the relationship between the cognitive demands of small programs and of real-world software systems remains unclear. Large ...

15 Inference bear: designing interactive interfaces through before and after snapshots

Martin R. Frank, Piyawadee Noi Sukaviriya, James D. Foley

Full text available: pdf(1.08 MB)   Additional Information: full citation, references, citings, index terms

16 BA session: shared memory objects: Brief announcement: implementing multi-word atomic snapshots on current hardware

Chris Purcell, Tim Harris

Full text available: pdf(57.22 KB)   Additional Information: full citation, references, index terms

Keywords: atomic snapshots, lock-free, non-blocking

17 On the memory overhead of distributed snapshots

Lior Shabtay, Adrian Segall

Full text available: Additional Information:

18 Reconstruction of algorithms from memory snapshots of their execution
Frederick E. Petry, Alan W. Biermann
October 1976 **Proceedings of the annual conference**

Full text available: pdf(435.62 KB)   Additional Information: full citation, abstract, references, index terms

A system is described which utilizes a trace of memory snapshots taken during the execution of an algorithm. With such traces and a description of the environment in which the algorithm was executed, the algorithm can be reconstructed. In the first phase, decomputation of the results which appear in the snapshots is performed. Decomputation is the process which produces, for each result in the trace, the set of possible instructions which could have been its cause. The construction phase th ...

19 Distributed snapshots: determining global states of distributed systems
K. Mani Chandy, Leslie Lamport
February 1985 **ACM Transactions on Computer Systems (TOCS)**, Volume 3 Issue 1

Full text available: pdf(992.10 KB)   Additional Information: full citation, abstract, references, citings, index terms

This paper presents an algorithm by which a process in a distributed system determines a global state of the system during a computation. Many problems in distributed systems can be cast in terms of the problem of detecting global states. For instance, the global state detection algorithm helps to solve an important class of problems: stable property detection. A stable property is one that persists: once a stable property becomes true it remains true thereafter. Examples of stable properti ...

20 Replay, recovery, replication, and snapshots of nondeterministic concurrent programs
Haim Gaifman, Michael J. Maher, Ehud Shapiro
July 1991 **Proceedings of the tenth annual ACM symposium on Principles of distributed computing**

Full text available: pdf(1.23 MB)   Additional Information: full citation, references, citings, index terms

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1 Peer-to-peer infrastructure: Pastiche: making backup cheap and easy   ☐
Landon P. Cox, Christopher D. Murray, Brian D. Noble
December 2002 **ACM SIGOPS Operating Systems Review**, Volume 36 Issue SI

Full text available: 📄 pdf(1.65 MB)   Additional Information: full citation, abstract, references

Backup is cumbersome and expensive. Individual users almost never back up their data, and backup
is a significant cost in large organizations. This paper presents *Pastiche*, a simple and inexpensive
backup system. Pastiche exploits excess disk capacity to perform peer-to-peer backup with no
administrative costs. Each node minimizes storage overhead by selecting peers that share a
significant amount of data. It is easy for common installations to find suitable peers, and peers with
high ove ...

2 A methodology for fast PC hard disk state restoration   ◼
David D. Langan, Thomas J. Scott
March 1992 **Proceedings of the 1992 ACM/SIGAPP symposium on Applied computing:
            technological challenges of the 1990's**

Full text available: 📄 pdf(676.05 KB)   Additional Information: full citation, references, index terms

3 Documentation tools: Documentation meets version control: an automated backup system for ☐
HTML-based help
Robin Green
September 2000 **Proceedings of IEEE professional communication society international
              professional communication conference and Proceedings of the 18th annual ACM
              international conference on Computer documentation: technology & teamwork**

Full text available: 📄 pdf(449.11 KB)   Additional Information: full citation, abstract

Software developers have used version control systems for years, to manage source code changes
and to enable them to reproduce any given level of their software from the source code that created
it. Most writing departments, however, tend to perform full-scale weekly backups at best, or tempt
fate at worst. The two major reasons for this neglect of document version control are lack of
adequate tools and the effort required by writers to deal with the inadequate tools presently
available. This pa ...

4 Shared momory objects: Efficient synchronous snapshots   ◼
Alex Brodsky, Faith Ellen Fich
July 2004   **Proceedings of the twenty-third annual ACM symposium on Principles of distributed
            computing**

Full text available: 📄 pdf(186.05 KB)   Additional Information: full citation, abstract, references, index terms

A snapshot is an important object in distributed computing whose implementation in asynchronous
systems has been studied extensively. It consists of a collection of $m > 1$ components, each storing a
value, and supports two atomic operations: an UPDATE of a specified component's value and a SCAN
of all components to determine their values at some point in time.In this paper, we investigate
implementations of a multiwriter snapshot object in a synchronous shared memory model. In this
setti ...

Keywords: multiprocessor algorithms, shared memory objects

5 Backup Strategy   ◼
Malcolm Murphy
February 1996 **Linux Journal**

Malcolm tells us which files to backup and how often

6 Review: Arkeia 5.2 network backup
Dan Wilder
July 2004   **Linux Journal,** Volume 2004 Issue 123

7 Distributed snapshots: determining global states of distributed systems
K. Mani Chandy, Leslie Lamport
February 1985 **ACM Transactions on Computer Systems (TOCS),** Volume 3 Issue 1

This paper presents an algorithm by which a process in a distributed system determines a global state of the system during a computation. Many problems in distributed systems can be cast in terms of the problem of detecting global states. For instance, the global state detection algorithm helps to solve an important class of problems: stable property detection. A stable property is one that persists: once a stable property becomes true it remains true thereafter. Examples of stable properti ...

8 Join operations in temporal databases
Dengfeng Gao, S. Jensen, T. Snodgrass, D. Soo
March 2005   **The VLDB Journal — The International Journal on Very Large Data Bases,** Volume 14 Issue 1

Joins are arguably the most important relational operators. Poor implementations are tantamount to computing the Cartesian product of the input relations. In a temporal database, the problem is more acute for two reasons. First, conventional techniques are designed for the evaluation of joins with equality predicates rather than the inequality predicates prevalent in valid-time queries. Second, the presence of temporally varying data dramatically increases the size of a database. These factors i ...

Keywords: Attribute skew, Interval join, Partition join, Sort-merge join, Temporal Cartesian product, Temporal join, Timestamp skew

9 Frangipani: a scalable distributed file system
Chandramohan A. Thekkath, Timothy Mann, Edward K. Lee
October 1997 **ACM SIGOPS Operating Systems Review , Proceedings of the sixteenth ACM symposium on Operating systems principles,** Volume 31 Issue 5

10 Checkpoint repair for out-of-order execution machines
W. W. Hwu, Y. N. Patt
June 1987   **Proceedings of the 14th annual international symposium on Computer architecture**

Out-of-order execution and branch prediction are two mechanisms that can be used profitably in the design of Supercomputers to increase performance. Unfortunately this means there must be some kind of repair mechanism, since situations do occur that require the computing engine to repair to a known previous state. One way to handle this is by checkpoint repair. In this paper we derive several properties of checkpoint repair mechanisms. In addition, we provide algorithms for performing check ...

11 Measuring the internet's vital statistics: Collecting the internet AS-level topology
Beichuan Zhang, Raymond Liu, Daniel Massey, Lixia Zhang
January 2005 **ACM SIGCOMM Computer Communication Review,** Volume 35 Issue 1

At the inter-domain level, the Internet topology can be represented by a graph with Autonomous Systems (ASes) as nodes and AS peerings as links. This AS-level topology graph has been widely used in a variety of research efforts. Conventionally this topology graph is derived from routing tables collected by Route Views or RIPE RIS. In this work, we assemble the most complete AS-level topology by extending the conventional method along two dimensions. First, in addition to using data from RouteVie ...

12
Practical byzantine fault tolerance and proactive recovery

Miguel Castro, Barbara Liskov
Full text available: ▓ pdf(1.63 MB)   Additional Information: full citation, abstract, references, citings, index terms, review

Our growing reliance on online services accessible on the Internet demands highly available systems that provide correct service without interruptions. Software bugs, operator mistakes, and malicious attacks are a major cause of service interruptions and they can cause arbitrary behavior, that is, Byzantine faults. This article describes a new replication algorithm, BFT, that can be used to build highly available systems that tolerate Byzantine faults. BFT can be used in practice to implement re ...

Keywords: Byzantine fault tolerance, asynchronous systems, proactive recovery, state machine replication, state transfer

[13] An on-the-fly mark and sweep garbage collector based on sliding views ▬

Hezi Azatchi, Yossi Levanoni, Harel Paz, Erez Petrank
Full text available: ▓ pdf(244.12 KB)   Additional Information: full citation, abstract, references, citings, index terms

With concurrent and garbage collected languages like Java and C# becoming popular, the need for a suitable non-intrusive, efficient, and concurrent multiprocessor garbage collector has become acute. We propose a novel mark and sweep on-the-fly algorithm based on the sliding views mechanism of Levanoni and Petrank. We have implemented our collector on the Jikes Java Virtual Machine running on a Netfinity multiprocessor and compared it to the concurrent algorithm and to the stop-the-world collecto ...

Keywords: concurrent garbage collection, garbage collection, memory management, on-the-fly garbage collection, runtime systems

[14] Middleware for replication and transactions: Ganymed: scalable replication for transactional web applications ▬

Christian Plattner, Gustavo Alonso
Full text available: ▓ pdf(295.27 KB)   Additional Information: full citation, abstract, references

Data grids, large scale web applications generating dynamic content and database service providing pose significant scalability challenges to database engines. Replication is the most common solution but it involves difficult trade-offs. The most difficult one is the choice between scalability and consistency. Commercial systems give up consistency. Research solutions typically either offer a compromise (limited scalability in exchange for consistency) or impose limitations on the data schema an ...

[15] Petal: distributed virtual disks ▬

Edward K. Lee, Chandramohan A. Thekkath
Full text available: ▓ pdf(1.10 MB)   Additional Information: full citation, abstract, references, citings, index terms

The ideal storage system is globally accessible, always available, provides unlimited performance and capacity for a large number of clients, and requires no management. This paper describes the design, implementation, and performance of Petal, a system that attempts to approximate this ideal in practice through a novel combination of features. Petal consists of a collection of network-connected servers that cooperatively manage a pool of physical disks. To a Petal client, this collection appear ...

[16] Active middleware services in a decision support system for managing highly available distributed resources ▬

Sameh A. Fakhouri, William F. Jerome, Vijay K. Naik, Ajay Raina, Pradeep Varma
Full text available: ▓ pdf(306.87 KB)   Additional Information: full citation, abstract, references

We describe a decision support system called Mounties that is designed for managing applications and resources using rule-based constraints in scalable mission-critical clustering environments. Mounties consists of four active service components: (1) a repository of resource proxy objects for modeling and manipulating the cluster configuration; (2) an event notification mechanism for monitoring and controlling interdependent and distributed resources; (3) a rule evaluation and decision proces ...

[17] Comparison of access methods for time-evolving data ▬

Betty Salzberg, Vassilis J. Tsotras

Full text available: pdf(529.53 KB)   Additional Information: full citation, abstract, references, citings, index terms

This paper compares different indexing techniques proposed for supporting efficient access to temporal data. The comparison is based on a collection of important performance criteria, including the space consumed, update processing, and query time for representative queries. The comparison is based on worst-case analysis, hence no assumptions on data distribution or query frequencies are made. When a number of methods have the same asymptotic worst-case behavior, features in the methods tha ...

Keywords: I/O performance, access methods, structures, temporal databases

18 Reliability mechanisms for ADAMS
S. H. Son, J. L. Pfaltz
January 1989 **Proceedings of the third conference on Hypercube concurrent computers and applications - Volume 2**
Full text available: pdf(984.13 KB)   Additional Information: full citation, abstract, references, citings, index terms

The goal of checkpointing in database management systems is to save database states on a separate secure device so that the database can be recovered when errors and failures occur. This paper presents a non-interfering checkpointing mechanism being developed for ADAMS. Instead of waiting for a consistent state to occur, our checkpointing approach constructs a state that would result by completing the transactions that are in progress when the global checkpoint begins. The checkpointing alg ...

19 Fault-tolerant computing based on Mach
Özalp Babaoğlu
January 1990 **ACM SIGOPS Operating Systems Review,** Volume 24 Issue 1
Full text available: pdf(963.85 KB)   Additional Information: full citation, abstract, citings, index terms

We consider the problem of providing automatic and transparent fault tolerance to arbitrary user computations based on the Mach operating system. Among the several alternatives for structuring such a system, we pursue the "task-pair backup" paradigm in detail and outline how it might be supported by Mach. Some of the new system calls and protocols that need to be incorporated into the Mach kernel and server tasks are sketched.

20 ARIES: a transaction recovery method supporting fine-granularity locking and partial rollbacks using write-ahead logging
C. Mohan, Don Haderle, Bruce Lindsay, Hamid Pirahesh, Peter Schwarz
March 1992 **ACM Transactions on Database Systems (TODS),** Volume 17 Issue 1
Full text available: pdf(5.23 MB)   Additional Information: full citation, abstract, references, citings, index terms, review

DB2TM, IMS, and TandemTM systems. ARIES is applicable not only to database management systems but also to persistent object-oriented languages, recoverable file systems and transaction-based operating systems. ARIES has been implemented, to varying degrees, in IBM's OS/2TM Extended Edition Database Manager, DB2, Workstation Data Save Facility/VM, Starburst and QuickSilver, and in the University of Wisconsin's EXODUS and Gamma d ...

Keywords: buffer management, latching, locking, space management, write-ahead logging